

CLAIMS

1. A method for making a methacrylate unit-containing polymer with a polydispersity less than 1.7 and comprising at least one cross-linkable functional group, the method comprising a step of radically polymerizing a mixture of ethylenically unsaturated monomers comprising at least 50 mole% of methacrylate monomers to a polymer in the presence of a) a radical precursor and b) I₂ or a sulfonyl iodide.
2. The method according to claim 1 wherein the sulfonyl iodide is an aromatic sulfonyl iodide.
3. The method according to claim 2 wherein the aromatic sulfonyl sulfonyl iodide is p-toluenesulfonyl iodide.
4. The method according to claim 1 wherein the temperature during the polymerization step is lower than about 130°C.
5. The method according to claim 1 wherein the temperature during the polymerization step is lower than about 110°C.
6. The method according to claim 1 wherein the temperature during the polymerization step is lower than about 90°C.
7. The method according to claim 1 wherein the temperature during the polymerization step is lower than about 70°C.
8. The method according to claim 1 wherein the mole ratio of the sulfonyl iodide to the radical precursor is greater than 0.1n, or wherein the mole ratio of the I₂ to the radical precursor is between

0.05n and 0.5n, wherein n stands for the number of radicals effectively generated per molecule of radical precursor.

5 9. The method according to claim 1 wherein the polymerization is performed in the presence of an epoxide-containing compound.

10. The method according to claim 9 wherein the mole ratio of the epoxide to the iodine atom is at least 0.01.

10 11. The method according to claim 10 wherein the mole ratio of the epoxide to the iodine atom is at least 0.05.

12. A block or gradient copolymer comprising the polymer obtained according to claim 1.

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13. The method according to claim 1 further comprising a second step wherein the iodine atom is removed from the polymer.

14. The method according to claim 13 wherein the iodine atom is removed by nucleophilic reaction, by heating, or by reaction with a radical generating compound, optionally under reducing conditions.

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15. A cross-linkable composition for making a polymeric network comprising the polymer obtained according to claim 1

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16. The cross-linkable composition of claim 15 wherein the composition is a coating composition, an adhesive, an ink formulation, an automotive OEM or repair coating, or an industrial coating composition.

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17. A polymerization process utilizing the polymer obtained according to claim 1.